

Semi-Monthly Daily LFG Well Temperature Update

King, Brandon <BKing@scsengineers.com>

Fri 1/20/2023 10:06 AM

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Cc: Dick, Bob <BDick@scsengineers.com>; Warren, Charles <CWarren@scsengineers.com>; Nachman, Lucas <LNachman@scsengineers.com>; Mahon, Ryan <RMahon@scsengineers.com>; Lock, Tom <TLock@scsengineers.com>

Ms. Hall and Ms. Blalock,

In accordance with EPA's letter, "Approval of Higher Operating Temperature Values of Landfill Gas Wells and Submission of Gas Treatment Alternatives at the Bristol Virginia Integrated Solid Waste Facility" from August 2021, I am providing the January 19th, 2023 status update on the existing wells, expansion of the gas collection system, and continuing operating and monitoring results, covering the period from January 1-15, 2023.

Thank you,

D. Brandon King

SCS Engineers

Project Manager

15521 Midlothian Turnpike, Suite 305

Midlothian, VA 23113

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January 19, 2023
File No. 02218208.04

MEMORANDUM

TO: Kristin Hall, EPA Region III
Tracy Blalock, VDEQ-SWRO

FROM: D. Brandon King, SCS Engineers
Robert E. Dick, SCS Engineers

SUBJECT: Semi-Monthly Status Update – January 1st through January 15th, 2023
Bristol Integrated Waste Management Facility, Bristol, Virginia

In accordance with the Environmental Protection Agency (EPA) Region III letter, *Approval of Higher Operating Temperature Values for Landfill Gas Wells and Submission of Gas Treatment Alternatives at the Bristol Virginia Integrated Solid Waste Management Facility*, dated 8/23/21, SCS is submitting this semi-monthly status update to satisfy the condition of compliance provision #2. This compliance provision report includes daily temperature readings of the existing and new wells installed. In addition, this report includes a summary of work accomplished during this reporting period of 12/16/22 through 12/31/22, pursuant of compliance provision #2.

DAILY TEMPERATURE READINGS

Twenty-five (25) individual landfill gas (LFG) wellheads in the Permit #588 Landfill have automated temperature sensors installed. Beginning on 12/1/22, VDEQ and USEPA are receiving Daily Landfill Gas Well Temperature Averages Reports presenting the data measured by the automated temperature sensors.

The LFG wellhead automated temperature sensor system is still undergoing commissioning and SCS staff is still conducting verification testing and making minor field modifications to this system. Some values reported may differ from recordings made by other field instrumentation. SCS may elect to report values gathered from other data sources (GEM, field thermometer) for regulatory purposes until commissioning is complete.

The City recorded daily temperature readings during the first half of January, which are displayed on the attached table. Existing well GW-37 had recorded readings greater than 145F throughout the majority of this reporting period. However, well GW-46 recorded temperatures below 145F throughout the reporting period according to the City's data. New wells GW-57 and GW-64 recorded temperatures greater than 145F throughout the majority of this reporting period, while GW-52, GW-53, and GW-67 recorded temperatures greater than 145F intermittently during the first half of January according to the City's data.

LFG ANALYTICAL DATA REVIEW

The City and SCS are still awaiting the EPA's evaluation of the Higher Operating Value for Temperature Request letter submitted to EPA on 3/8/22. According to LFG monthly wellfield data recorded during January 2023, LFG monthly wellfield retest data, exceedance temperatures continue in HOV requested well GW-37 according to the January initial wellfield monitoring data. In



addition, temperatures greater than 145F were recorded in wells GW-57 and GW-64 during January wellfield monitoring by SCS. However, LFG well GW-64 recorded temperatures below 145F during retest activities on 1/12/23. LFG well GW-67 recorded temperatures below 145F during January monthly wellfield monitoring activities by SCS. SCS recorded temperatures below 145F at the remaining wells during the January initial wellfield monitoring event.

SCS collected a CO sample via 1.5L Summa Canister at well GW-37 on 12/30/22 and received the laboratory analytical data on 1/5/23. GW-37 recorded a CO concentration of 180 ppm. The laboratory analytical data is included for reference.

NON-ROUTINE O&M

The O&M contractor completed installation of the 10'x10' well bore skirts with approximately one foot of cover soil that overlaps the edges of the skirt in late December. The contractor compacted the soil with the excavator bucket and the neck of the skirt was secured to the well casing using a banding clamp. SCS conducted two consecutive weekly surface emissions monitoring (SEM) events during this reporting period where no locations greater than 500 ppm were recorded at either the serpentine route or at any pipe penetration.

SCS Field Services (FS) Construction has commenced construction of the Sidewall Odor Mitigation System (SOMS) effectively as of the week of 12/19/22. SCS-FS is working with several subcontractors for various facets such as liner system and concrete work. The initial phase of construction on the SOMS is on the western sidewall section deemed the pilot-study Phase I.

SCS is continuing work monitoring, balancing, and tuning the south end leachate cleanouts.

EVALUATION OF LFG SYSTEM

SCS is continuing weekly surface emissions monitoring per the Plan of Action Report dated 7/6/22. The City has placed intermediate cover throughout the Permit No. 588 Landfill based on soil boring testing results, including soil cover over the LFG, airline, and forcemain piping. Subsequent to the installation of the well bore skirts at 19 select LFG wells exhibiting methane exceedances at pipe penetrations during weekly SEM events, SCS monitoring data has shown significant improvement at all locations now exhibiting methane concentrations below 500 ppm.

SCS Engineers will continue to balance and tune the LFG wellheads on the south leachate cleanouts in January, as well as other LFG System wells. SCS has already noticed improvements in LFG quality at the blower/flare station as a result of the south cleanout improvements. Furthermore, the City and SCS anticipate commencement of landfill gas (LFG) system expansion construction in the near future.

Please contact SCS or City personnel if you have any questions or require additional information.

cc: Randall Eads, City of Bristol
Jon Hayes, City of Bristol
Jeff Hurst, VDEQ-SWRO
Tom Lock, SCS Field Services

David Cochran, City of Bristol
Erin Willard, EPA Region III
Stacy Bowers, VDEQ-SWRO
Robert E. Dick, P.E., SCS Engineers

Note	Well Depth	Date Drill	Phase	Month	January	January	January	January	January	January	January	January	January	January	January	January	January	January			
				Day	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
				Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
				Well Number																	
1	102	10/16/2016	Old Well	35	*Unable to record temperature readings at LFG vertical wells in the Permit 588 Landfill.		NM	74	*Unable to record temperature readings at LFG vertical wells in the Permit 588 Landfill.	66	59	50	52	50	52	60	66	*Unable to record temperature readings at LFG vertical wells in the Permit 588 Landfill.	63	60	
2	70	9/6/2017	Old Well	39			NM	78		64	51	45	47	44	44	54	61		58	55	
3	100	9/7/2017	Old Well	40			NM	128		122	113	120	118	118	120	124	127		120	125	
4	110	10/4/2016	Old Well	46			NM	140		138	144	143	143	112	111	143	143		142	140	
5	120	10/4/2016	Old Well	47			NM	110		108	98	99	95	95	90	95	99		94	98	
6	120	9/17/2013	Old Well	29			NM	102													
7	100	8/23/2017	Old Well	30R			NM	130		90	88	81	82	96	107	107	107		107	106	
8	120	8/30/2017	Old Well	31R			NM	140		131	128	127	129	120	124	127	128		126	124	
9	70	7/29/2016	Old Well	32			NM	78		138	132	134	137	132	134	135	136		135	136	
10	100	7/28/2016	Old Well	33			NM	130		76	66	61	65	69	71	74	96		69	74	
11	100	7/30/2016	Old Well	34			NM	140		130	128	128	127	127	127	127	127		127	127	
12	100	8/1/2016	Old Well	36			NM	76		140	102	128	123	119	120	120	138		135	120	
13	100	8/24/2017	Old Well	37			NM	152		64	54	44	48	53	55	60	63		63	60	
14	50	8/25/2017	Old Well	38			NM	110		142	150	150	150	150	151	150	150		150	150	
15	75	9/8/2017	Old Well	41			NM	122		104	104	100	100	87	88	102	102		100	102	
16	57	9/8/2017	Old Well	42			NM	120		122	112	104	99	96	100	101	101		98	101	
17	110	10/7/2016	Old Well	48		NM	80	118	110	110	108	109	117	114	113	112	113				
								62	57	36	41	41	55	58	65	58	63				
1	120	10/1/2021	New Well	32R	*Unable to record temperature readings at LFG vertical wells in the Permit 588 Landfill.		NM	130	*Unable to record temperature readings at LFG vertical wells in the Permit 588 Landfill.	122	127	127	126	127	128	128	128	128	120		
2	110	10/1/2021	New Well	49			NM	136		140	136	135	135	135	135	135	135	135	135		
3	96	10/1/2021	New Well	50			NM	136		122	121	124	124	119	120	123	127	124	123		
4	114	10/1/2021	New Well	51			NM	132		128	116	116	118	105	102	121	127	121	126		
5	109	10/1/2021	New Well	52			NM	148		142	142	128	129	126	128	133	130	130	133		
6	91	10/1/2021	New Well	53			NM	146		144	110	138	139	137	135	155	152	152	150		
7	91	10/1/2021	New Well	54			NM	140		136	134	128	139	137	137	133	124	130	127		
8	104	10/1/2021	New Well	55			Test port unreacha			port unreacha	97	98	99	93	94	98	98	97	98		
9	109	10/1/2021	New Well	56			NM	138		131	110	133	131	131	129	132	134	132	134		
10	103	10/1/2021	New Well	57			NM	152		150	150	146	150	147	140	173	177	170	176		
11	92	10/1/2021	New Well	58			NM	120		122	119	127	120	120	122	122	122	122	121		
12	72	10/1/2021	New Well	59			NM	118		42	116	111	112	111	112	118	120	118	115		
13	120	10/1/2021	New Well	60				Blowing Foam		136	126	123	119	105	106	110	113	111	112		
14	105	10/1/2021	New Well	61			NM	124		130	127	127	129	123	115	130	128	127	126		
15	120	10/1/2021	New Well	62			NM	72		58	44	42	41	42	54	63	62	62	63		
16	117	10/1/2021	New Well	63			NM	137		130	129	122	121	122	125	126	124	125	126		
17	120	10/1/2021	New Well	64			NM	150		148	145	144	145	144	145	145	145	145	149		
18	100	10/1/2021	New Well	65			NM	137		134	134	134	135	134	134	135	134	134	133		
19	102	10/1/2021	New Well	66			Test port unreacha			port unreacha	129	port unreacha	port unreacha	port unreacha	port unreacha	133	131	131	131		
20	100	10/1/2021	New Well	67			NM	148		138	122	128	111	127	128	120	130	128	127		
21	75	10/1/2021	New Well	68			NM	130		130	128	128	129	128	125	127	127	127	125		

*Note: there was a low level isolated area in the Permit #588 Landfill where emissions hovered over the landfill surface on 1/1/23, 1/4/23, and 1/13/23. Therefore daily temperatures were not recorded on those days by City of Bristol personnel for health and safety reasons.



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Certificate of Analysis

Final Report

Laboratory Order ID 23A0017

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	January 3, 2023 11:55
	4330 Lewis Road, Suite 1	Date Issued:	January 5, 2023 14:06
	Harrisburg, PA 17111	Project Number:	07220028.00
Submitted To:	Tom Lock	Purchase Order:	07-SO04485
Client Site I.D.:	Bristol		

Enclosed are the results of analyses for samples received by the laboratory on 01/03/2023 11:55. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

A handwritten signature in black ink that reads 'Ted Soyars'.

Ted Soyars

Technical Director

End Notes:

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

This report shall not be reproduced except in full without the expressed and written approval of an authorized representative of Enthalpy Analytical, Inc.





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Harrisburg, PA 17111 Project Number: 07220028.00
Submitted To: Tom Lock Purchase Order: 07-SO04485

Client Site I.D.: Bristol

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
37	23A0017-01	Air	12/30/2022 11:50	01/03/2023 11:55



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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07220028.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:

Sample Description/Location:

Initial Vacuum(in Hg):

Field Sample #: 37

Sub Description/Location:

Final Vacuum(in Hg):

Sample ID: 23A0017-01

Canister ID: 063-00021::12408

Receipt Vacuum(in Hg):

Sample Matrix: Air

Canister Size: 1.4L

Flow Controller Type: Passive

Sampled: 12/30/2022 11:50

Flow Controller ID:

Sample Type: LV

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	180	90.0	90.0		9	1	1/4/23 15:20	MER

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	13.6	0.45	0.45		9	1	1/4/23 15:20	MER
Carbon dioxide, as received	27.5	0.45	0.45		9	1	1/4/23 15:20	MER
Oxygen (O2), as received	5.87	0.45	0.45		9	1	1/4/23 15:20	MER
Hydrogen (H2), as received	2.51	0.18	0.18		9	1	1/4/23 15:20	MER
Nitrogen (N2), as received	42.5	9.00	9.00		9	1	1/4/23 15:20	MER



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Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis			Preparation Method:	No Prep VOC GC Air	
23A0017-01	1.00 mL / 1.00 mL	ALT-145	BGA0076	SGA0057	AG00026
23A0017-01	1.00 mL / 1.00 mL	EPA 3C	BGA0076	SGA0057	AG00026



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Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	------

Batch BGA0076 - No Prep VOC GC Air

Blank (BGA0076-BLK1)

Prepared & Analyzed: 01/04/2023

Methane	<	0.05	Vol%
Carbon dioxide	<	0.05	Vol%
Oxygen (O2)	<	0.05	Vol%
Hydrogen (H2)	<	0.02	Vol%
Nitrogen (N2)	<	1.00	Vol%
Carbon Monoxide	<	10.0	ppmv

LCS (BGA0076-BS1)

Prepared & Analyzed: 01/04/2023

Methane	4650	500	ppmv	5000	93.0	0-200
Methane	4650	0.05	ppmv	5000	93.0	70-130
Carbon dioxide	4120	500	ppmv	5000	82.4	0-200
Carbon dioxide	4120	0.05	ppmv	5000	82.4	70-130
Oxygen (O2)	5410	500	ppmv	5000	108	0-200
Oxygen (O2)	5410	0.05	ppmv	5000	108	70-130
Nitrogen (N2)	5570	1	ppmv	5000	111	70-130
Hydrogen (H2)	5950	200	ppmv	5100	117	0-200
Hydrogen (H2)	5950	0.02	ppmv	5100	117	70-130
Nitrogen (N2)	5570	2000	ppmv	5000	111	0-200
Carbon Monoxide	4890	10	ppmv	5000	97.9	0-200
Carbon Monoxide	4890	0.001	ppmv	5000	97.9	70-130

Duplicate (BGA0076-DUP1)

Source: 23A0017-01

Prepared & Analyzed: 01/04/2023

Methane	137000	4500	ppmv	136000	0.606	25
Methane	13.7	0.45	Vol%	13.6	0.606	5
Carbon dioxide	278000	4500	ppmv	275000	1.02	25
Carbon dioxide	27.8	0.45	Vol%	27.5	1.02	5
Oxygen (O2)	5.90	0.45	Vol%	5.87	0.422	5
Oxygen (O2)	59000	4500	ppmv	58700	0.422	25
Nitrogen (N2)	42.7	9.00	Vol%	42.5	0.610	5
Hydrogen (H2)	25300	1800	ppmv	25100	0.583	25
Nitrogen (N2)	427000	18000	ppmv	425000	0.610	25
Hydrogen (H2)	2.53	0.18	Vol%	2.51	0.583	5



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Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

Enthalpy Analytical

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units		Result	%REC	Limits	RPD	Limit	Qual

Batch BGA0076 - No Prep VOC GC Air

Duplicate (BGA0076-DUP1)

Source: 23A0017-01

Prepared & Analyzed: 01/04/2023

Carbon Monoxide	184	90.0	ppmv	180	2.28	25
Carbon Monoxide	0.02	0.009	Vol%	0.02	2.28	5

Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
EPA 3C in Air			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	07/31/2023
NCDEQ	North Carolina DEQ	495	07/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023



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Qualifiers and Definitions

RPD Relative Percent Difference
Qual Qualifiers
-RE Denotes sample was re-analyzed
PF Preparation Factor
MDL Method Detection Limit
LOQ Limit of Quantitation
ppbv parts per billion by volume

TIC Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.

All EPA method 3C results are reported as normalized values when the sum total of all evaluated constituents is outside $\pm 10\%$ of the absolute.

Project: Bristol

12/30/22

11:45 AM

SCS Field Service.

Job # 07220028.00

Sample	Flow Control	air flow	Canister ID	Size	Clean batch #	Lab outgoing Can Vac.	Lab receiving Can Vac
37	003-00491	ST005	12408	1.4	271122-03	21.2	9
	Start Date	Start time	Int. Can Vac	Starting temp	Stop Date	Stop time	Final Can Vac
37	12/30/22	11:40 AM	27	148.2	12/30/22	11:50 AM	9
							End temp 148

Analysis { AIT 145 *
Hydrogen *
EPA 3C *

SCS Field Services 23A0017
Bristol

Recd: 01/03/2023 Due: 01/10/2023

v130325002

Relinquished: Ryan
Seyman
12/30/2022
Fedex
Fedex
40 1/3/23
1155

5:21

using this cause my last copy was ruined.

note
noseal 20.9
30